

REMARKS

Claims 1, 3-8, 10, 11 and 60-73 are all the claims pending in the application.

Claim 8 has been amended to recite the amino acid sequence of a nitrile hydratase (SEQ ID NOs 4 and/or 5). Support for this amendment can be found on page 22, lines 3-12, Example 17, and in the sequence listing of the present specification.

Claims 1 and 3-7 as amended are dependent directly or in directly on claim 8.

Claim 72 has been amended to correct a clerical error.

Claim 73 has been newly added. Support for new claim 73 can be found in Example 7 and in the sequence listing of the present specification. Accordingly, no new matter has been added.

The Examiner has rejoined claims 62-71 to be examined with elected claims 8, 10, 11, 60, 61, and 72. Thus, claims 8, 10, 11, and 60-72 are currently under examination.

Claims 1 and 3-7 are also pending, although these claims are currently withdrawn from consideration as being drawn to a non-elected invention. However, these claims should be rejoined in this application as they now depend from, or otherwise include all of the limitations elected of claim 8.

Turning now to the outstanding Office Action.

The Examiner rejects claims 8, 10 and 60-72 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The Examiner believes that the presently claimed microorganisms must be described by their nitrilase and nitrile hydratase gene or protein sequences.

The Examiner acknowledges that the claimed microbes have been characterized by their enzymatic properties. However, the Examiner contends that the specification describes variant microorganisms having destroyed or deleted enzymes that participate in the production of amide compounds. Specifically, the Examiner refers to page 22 of the specification that describes the inactivation of genes, such a nitrile hydratase, by homologous recombination.

The Examiner concludes that, since the specification only discloses SEQ ID NOS. 2, 4, 5 and 7 relevant to nitrile hydratase, nitrilase and amidase genes, the claims must be similarly limited.

Applicants agree with the Examiner in that the "activity of converting a cyano group into an amide group" is important and critical to the claimed invention. Thus, claim 8 has been amended to recite the amino acid sequence of the nitrile hydratase (SEQ ID NOs 4 and/or 5).

However, claim 8 does not recite an amidase at all, so there is no requirement that claim 8 should recite the amino acid sequence of the amidase (SEQ ID NO: 7). In addition, the microorganism belonging to the genus *Rhodococcus* is one of the microorganisms which have a nitrilase activity (See page 19, lines 11-18 of the present specification), and it is natural for the microorganism of claim 8 belonging to the genus *Rhodococcus* to have an endogenous activity of converting a cyano group into a carboxyl group. Therefore, claim 8 contains the subject matter of the nitrilase activity which is described in the present specification in such a way as to be reasonably conveyed to one skilled in the art, and there is no requirement that claim 8 should recite the amino acid sequence of the nitrilase (SEQ ID NO: 2).

Accordingly, amended claim 8 is believed to comply with the written description requirement. Claims 10 and 60-73 are either directly or indirectly dependent on claim 8, and thus also comply with the written description requirement. Hence, the Examiner is requested to withdraw this rejection.

The Examiner rejects claims 8, 10 and 60-72 under 35 U.S.C. §103(a) as being obvious over US Patent 4,629,700 to Prevatt et al., in view of Alberts et al., *Molecular Biology of the Cell* (1994) and Bunch, Antonie Van Leeuwenhoek (1998).

Specifically, with respect to claims 8, 10, 60 and 61, the Examiner contends that Prevatt teaches *Rhodococcus* sp. ATCC39484, and teaches culturing this microorganism in the presence of nitriles to produce various compounds.

The Examiner admits that Prevatt does not teach a *Rhodococcus* sp. that is defective or reduced in an endogenous activity of converting a cyano group into an amide.

However, the Examiner believes that Bunch teaches that *Rhodococcus* sp. are capable of converting nitriles to amides or carboxylic acids. Furthermore, the Examiner asserts that, according to Bunch, rhodococcal nitrilases are capable of hydrolyzing a wide range of nitriles, often with region- and stereoselectivity.

The Examiner also refers to Alberts et al. as teaching that genes can be replaced with mutant genes by homologous recombination in bacteria.

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the *Rhodococcus* sp. taught by Prevatt by homologous recombination, such that its endogenous nitrile hydratase gene is replaced with a

nitrile hydratase having defective or reduced activity. The Examiner believes that the motivation stems from the desire to create beneficial mutant *Rhodococcus* strains that produce carboxylic acids without making amide intermediates.

For the following reasons, Applicants respectfully traverse the Examiner's rejection.

The microorganism of claim 8 possesses the technical feature of "being defective or reduced in an endogenous activity of expressing an enzyme activity of a nitrile hydratase having the amino acid sequence shown by SEQ ID NOs 4 and/or 5 of the sequence listing".

In contrast, none of the cited references teach the nitrile hydratase having the amino acid sequence shown by SEQ ID NOs 4 and/or 5 of the sequence listing. In addition, none of the cited references teach or suggest the motivation of introducing the aforementioned technical feature to the microorganism belonging to the genus *Rhodococcus*. The cited references only teach a nitrile hydratase as one of the enzymes participating in the biological hydrolysis of nitriles for producing the corresponding carboxylic acids (see for example page 89, right column, lines 10-13 of Bunch and abstract of JP2001-069978). The aforementioned motivation appears to derive solely from the present specification.

Therefore, claim 8 would not have been obvious for a person skilled in the art from the cited references alone or in combination, and should be allowable. Claims 10 and 60-73 are either directly or indirectly dependent on the allowable claim 8, and should also be allowable.

The Examiner is requested to note that JP2001-06997 was published in Japan on March 21, 2001. On the other-hand, the international filing date of the present application is October 25, 2000. Therefore, JP2001-06997 is not prior art available under 35 USC 102(a)-

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102(g) and 103(a) (see MPEP Section 2141.01). Thus, the Examiner is respectfully requested to withdraw any reliance on JP2001-06997.

Claims 1 and 3-7 relate to a biotechnological process, and are currently withdrawn from consideration as being drawn to a non-elected invention. However, claims 1 and 3-7 use the microorganism of claim 8 that should be allowable. Therefore, claims 1 and 3-7 should be allowable under 35 USC 103(b).

It is respectfully requested that claims 1 and 3-7 be rejoined and examined in the present application.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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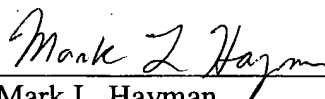
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